

**What Is Claimed Is:**

1           1. A method of processing multi-protocol label switching (MPLS) packets in a  
2 MPLS device, said method comprising:

3           receiving a configuration data identifying a group of multi-labeled packets and a  
4 corresponding desired EXP value for a stack entry at a low level for said group of multi-  
5 labeled packets;

6           receiving a multi-labeled packet containing a data packet and a plurality of stack  
7 entries including a low stack entry at said low level;

8           determining whether said multi-labeled packet falls in said group;

9           setting EXP bits of said low stack entry to said corresponding desired value if said  
10 multi-labeled packet falls in said group; and

11          forwarding said multi-labeled packet containing said desired value in EXP bits in  
12 said low stack entry.

1           2. The method of claim 1, wherein said MPLS device comprises an autonomous  
2 system border router (ASBR) located at an edge of a network managed by a service  
3 provider, wherein said service provider controls service levels in forwarding said multi-  
4 labeled packet further down a path by setting said EXP bits.

1           3. The method of claim 2, wherein said group of multi-labeled packets are  
2 identified by a value in EXP bits of a specific stack entry, wherein said determining  
3 comprises examining said multi-labeled packet as received for said value in EXP bits of

4     said specific stack entry.

1             4. The method of claim 1, wherein said data packet is received in the form of  
2     Internet Protocol (IP).

1             5. A machine readable medium carrying one or more sequences of instructions for  
2     causing a multi-protocol label switching (MPLS) to process packets, wherein execution  
3     of said one or more sequences of instructions by one or more processors contained in said  
4     MPLS device causes said one or more processors to perform the actions of:

5             receiving a configuration data identifying a group of multi-labeled packets and a  
6     corresponding desired EXP value for a stack entry at a low level for said group of multi-  
7     labeled packets;

8             receiving a multi-labeled packet containing a data packet and a plurality of stack  
9     entries including a low stack entry at said low level;

10            determining whether said multi-labeled packet falls in said group;

11            setting EXP bits of said low stack entry to said corresponding desired value if said  
12     multi-labeled packet falls in said group; and

13            forwarding said multi-labeled packet containing said desired value in EXP bits in  
14     said low stack entry.

1             6. The machine readable medium of claim 5, wherein said MPLS device  
2     comprises an autonomous system border router (ASBR) located at an edge of a network

managed by a service provider, wherein said service provider controls service levels in forwarding said multi-labeled packet further down a path by setting said EXP bits.

7. The machine readable medium of claim 6, wherein said group of multi-labeled packets are identified by a value in EXP bits of a specific stack entry, wherein said determining comprises examining said multi-labeled packet as received for said value in EXP bits of said specific stack entry.

8. The machine readable medium of claim 5, wherein said data packet is received in the form of Internet Protocol (IP).

9. A MPLS (multi-protocol label switching) device processing MPLS packets, said MPLS device comprising:

a memory storing a configuration data identifying a group of multi-labeled packets and a corresponding desired EXP value for a stack entry at a low level for said group of multi-labeled packets;

an inbound interface receiving a multi-labeled packet containing a data packet and a plurality of stack entries including a low stack entry at said low level;

a label processing block determining whether said multi-labeled packet falls in said group and setting EXP bits of said low stack entry to said corresponding desired value if said multi-labeled packet falls in said group; and

an outbound interface forwarding said multi-labeled packet containing said desired

12 value in EXP bits in said low stack entry.

1 10. The MPLS device of claim 9, wherein said MPLS device comprises an  
2 autonomous system border router (ASBR) located at an edge of a network managed by  
3 a service provider, wherein said service provider controls service levels in forwarding  
4 said multi-labeled packet further down a path by setting said EXP bits.

1 11. The MPLS device of claim 10, wherein said group of multi-labeled packets  
2 are identified by a value in EXP bits of a specific stack entry, wherein said label  
3 processing block examines said multi-labeled packet as received for said value in EXP  
4 bits of said specific stack entry.

1 12. The MPLS device of claim 9, wherein said data packet is received in the form  
2 of Internet Protocol (IP).

1 13. A MPLS (multi-protocol label switching) device processing MPLS packets,  
2 said MPLS device comprising:

3 means for receiving a configuration data identifying a group of multi-labeled  
4 packets and a corresponding desired EXP value for a stack entry at a low level for said  
5 group of multi-labeled packets;

6 means for receiving a multi-labeled packet containing a data packet and a plurality  
7 of stack entries including a low stack entry at said low level;

8 means for determining whether said multi-labeled packet falls in said group;  
9 means for setting EXP bits of said low stack entry to said corresponding desired  
10 value if said multi-labeled packet falls in said group; and  
11 means for forwarding said multi-labeled packet containing said desired value in  
12 EXP bits in said low stack entry.

1 14. The MPLS device of claim 13, wherein said MPLS device comprises an  
2 autonomous system border router (ASBR) located at an edge of a network managed by  
3 a service provider, wherein said service provider controls service levels in forwarding  
4 said multi-labeled packet further down a path by setting said EXP bits.

1 15. The MPLS device of claim 14, wherein said group of multi-labeled packets  
2 are identified by a value in EXP bits of a specific stack entry, wherein said means for  
3 determining examines said multi-labeled packet as received for said value in EXP bits of  
4 said specific stack entry.

1 16. The MPLS device of claim 13, wherein said data packet is received in the  
2 form of Internet Protocol (IP).

1 17. A provider network containing:  
2 a MPLS (multi-protocol label switching) device processing MPLS packets, said  
3 MPLS device comprising:

4 a memory storing a configuration data identifying a group of multi-labeled  
5 packets and a corresponding desired EXP value for a stack entry at a low level for  
6 said group of multi-labeled packets;

7 an inbound interface receiving a multi-labeled packet containing a data  
8 packet and a plurality of stack entries including a low stack entry at said low level;

9 a label processing block determining whether said multi-labeled packet falls  
10 in said group and setting EXP bits of said low stack entry to said corresponding  
11 desired value if said multi-labeled packet falls in said group; and

12 an outbound interface forwarding said multi-labeled packet containing said  
13 desired value in EXP bits in said low stack entry.

1 18. The provider network of claim 17, further comprising an edge device  
2 receiving said multi-labeled packet from a private network and forwarding said multi-  
3 labeled packet to said MPLS device.

1 19. The provider network of claim 18, wherein said MPLS device comprises an  
2 autonomous system border router (ASBR) located at an edge of a network managed by  
3 a service provider, wherein a service provider controls service levels in forwarding said  
4 multi-labeled packet further down a path by setting said EXP bits.

1 20. The provider network of claim 19, wherein said group of multi-labeled packets  
2 are identified by a value in EXP bits of a specific stack entry, wherein said label

3     processing block examines said multi-labeled packet as received for said value in EXP  
4     bits of said specific stack entry.

1             21. The MPLS device of claim 19, wherein said data packet is received in the  
2     form of Internet Protocol (IP).

1             22. The provider network of claim 19, further comprising a plurality of core  
2     devices to forward said multi-labeled packet from said edge device to said ASBR.